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EXAMINER	
NG, CHRISTINE Y	
ART UNIT	PAPER NUMBER
2616	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	09/786,604	RITTER, GERHARD	
	Examiner	Art Unit	
	Christine Ng	2616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 December 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 3, 4, 8, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,583,870 to Delprat et al in view of U.S. Patent No. 5,983,101 to Billstrom, and in further view of U.S. Patent No. 6,125,125 to Narasimha et al.

Referring to claims 1 and 12, Delprat et al disclose a method of measuring transmission characteristics of radio channels in a radio communications system having base stations (Figure 2, BTS1, BTS2) and a radio station (Figure 2, M_A-M_D), the radio communications system utilizing a timeslot structure (Figure 1B) in a time frame for transmitting data. The method comprises:

Transmitting the data as bursts (Figure 1B, any of time slots IT1-IT7) from one of the base stations to the radio station, each of the data bursts having a channel measurement sequence (training sequence).

Wherein the base stations transmit channel measurement sequences as bursts having a structure that is substantially identical to a structure of the data bursts, each channel measurement sequence being transmitted in at least one timeslot (Figure 1B, time slots IT2, IT3, IT6, IT7) in which no data is transmitted to a radio station. In Figure

1B, time slots IT2, IT3, IT6, IT7 do not carry user information so are used instead to carry signaling data (Column 5, lines 1-18). The signaling data can have the same structure as normal bursts (Column 5, lines 19-28), and normal bursts contain a training sequence (Column 5, lines 35-36).

Delprat et al do not disclose wherein the base stations in the radio communications system transmit corresponding channel measurement sequences at substantially constant power levels.

Billstrom disclose in Figure 4A a method in which a base station selects (400) a transmit power density that is constant for all bitrates and modulation types. A C/I ratio is then calculated (408) to determine if it is greater than the minimum C/I for each terminal (410) and a corresponding modulation type is chosen. A change from one modulation type to another will not affect the C/I calculations since all modulation types are transmitted with the same power density. Refer to Column 5, line 57 to Column 7, line 11; and Column 8, lines 64-67. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the base stations in the radio communications system transmit corresponding channel measurement sequences at substantially constant power levels. One would be motivated to do so in order to maintain the same C/I characteristics even when the base stations change transmission properties, such as modulation type.

Delprat et al also do not disclose wherein the base stations in the radio communications system transmit corresponding channel measurement sequences at substantially a same time.

Narasimha et al disclose a method wherein the base stations transmit the channel measurement sequence (training sequence) using at substantially a same time. All base stations use a synchronizing mechanism to transmit frames to mobile stations at the same time so that the training sequences will be received by the mobile stations at virtually the same time. All base stations will be in substantial timing synchronization according to a GPS signal. Refer to Column 3, lines 5-49 and Column 4, line 58 to Column 5, line 5. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include wherein the base stations in the radio communications system transmit corresponding channel measurement sequences at substantially a same time. One would be motivated to do so in order to ease "handoff procedures when a mobile travels from one cell to another cell" (Column 5, lines 6-13).

Referring to claim 3, Delprat et al do not disclose that each channel measurement sequence is transmitted in a middle of a burst.

Narasimha et al disclose that the channel measurement sequence (training sequence) is transmitted in the middle of a burst. The base station "transmits a training sequence in the middle of every time slot so that the mobile station can learn the characteristics of the intervening radio path and train its equalizer" (Column 1, lines 38-41). Refer also to Column 3, lines 5-8. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that each channel measurement sequence is transmitted in a middle of a burst. One would be motivated to do so in order to follow the standards of GSM systems.

Referring to claim 4, refer to the rejection of claim 2.

Referring to claim 8, Delprat et al disclose transmitting a channel measurement sequence (training sequence) and using an identifier (rank 0) for the channel measurement sequence in a predetermined timeslot (Figure 1B, time slot IT0) in the time frame. Timeslot IT0 contains a synchronization sequence, identified by a rank of 0. Refer to Column 1, lines 39-49; Column 4, lines 61-63; and Column 5, lines 55-60.

Referring to claim 11, Delprat et al disclose that the predetermined timeslot is a 0-th timeslot. Refer to Column 1, lines 39-49; Column 4, lines 61-63; and Column 5, lines 55-60.

3. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,583,870 to Delprat et al in view of U.S. Patent No. 5,983,101 to Billstrom in view of U.S. Patent No. 6,125,125 to Narasimha et al, and in further view of U.S. Patent No. 5,274,669 to Klank et al.

Referring to claim 5, Delprat et al do not disclose that plural base stations transmit channel measurement sequences using cyclic correlation.

Klank et al disclose in Figure 3 a method of using cyclic correlation to determine the channel pulse response. Refer to Column 1, lines 56-65; Column 3, line 57 to Column 4, line 14; and Column 5, lines 11-14. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that plural base stations transmit channel measurement sequences using cyclic correlation. One would be motivated to do so so that the same basic training sequence can be utilized to determine channel measurements, thereby simplifying the system.

Referring to claim 6, Delprat et al not disclose that plural base stations transmit same channel measurement sequences.

Narasimha et al disclose in Figure 1 that "preferably, the training sequence transmitted from one BTS 14 is different than the training sequence transmitted by the other BTS's 14 that can cause co-channel interference" (Column 3, lines 9-11). This implies that BTS's that will not be subject to co-channel interference can have the same training sequence. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that that plural base stations transmit same channel measurement sequences. One would be motivated to do so so that the same basic training sequence can be used by all mobile stations in a system; thereby simplifying the system since all mobile stations tune into the same training sequence if it does not cause co-channel interference.

Referring to claim 7, Delprat et al do not disclose that different base stations transmit channel measurement sequences with different code phases.

Narasimha et al disclose in Figure 1 that the "training sequences are orthogonal and will not interfere with each other if received at a mobile unit at precisely the same time". Refer to Column 3, lines 12-14. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that different base stations transmit channel measurement sequences with different code phases. One would be motivated to do so so that training sequences can be differentiated from one another in order to avoid co-channel interference.

4. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,583,870 to Delprat et al in view of U.S. Patent No. 5,983,101 to Billstrom in view of U.S. Patent No. 6,125,125 to Narasimha et al, and in further view of U.S. Patent No. 4,577,334 to Boer et al.

Delprat et al disclose that the channel measurement sequence (training sequence) in the predetermined time slot (Figure 1B, time slot IT0) is substantially identical to channel measurement sequences in other time slots in the time frame (Figure 1B, time slots IT1-IT7). Refer to Column 5, lines 55-60. Refer to the rejection of claims 1 and 12.

Delprat et al do not disclose that phase modulating the channel measurement sequence in the predetermined time slot [claim 9] and phase modulating the channel measurement sequence in the predetermined timeslot by 180° from the time frame to a next time frame [claim 10].

Boer et al disclose in Figure 1 that the first part of a signal received over line 1 is a receiver training sequence that is phase modulated with two alternating phases modulated at a rate f_b on the carrier frequency f_c. Refer to Column 3, lines 35-39. As shown in Figure 2B, the phase alternations can be formed by 180° phase jumps. Refer to Column 3, lines 59-62. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that phase modulating the channel measurement sequence in the predetermined time slot [claim 9] and phase modulating the channel measurement sequence in the predetermined timeslot by 180° from the time frame to a next time frame [claim 10]. One would be motivated to do so

since phase modulation is a common form of modulation to carry signals across a channel, allowing the use of a single carrier frequency in which the signal is encoded into the phase changes of the carrier. A 180° phase modulation offers the advantage of only having to detect two phase changes at the receiver in order to recover the original signal, thereby minimizing error.

5. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No 5,583,870 to Delprat et al in view of U.S. Patent No. 5,983,101 to Billstrom in view of U.S. Patent No. 6,125,125 to Narasimha et al, and in further view of U.S. Patent No. 5,598,404 to Hayashi et al.

Referring to claim 13, Delprat et al do not disclose that the radio communication system comprises a TDD radio communication system.

Hayashi et al disclose that in a TDD system, the transmission/reception is performed in the same frequency band on the basis of time division. Refer to Column 2, lines 62-65. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the radio communication system comprises a TDD radio communication system. One would be motivated to do so since as compared with FDD, TDD offers more efficient use of the spectrum and bandwidth since each user is allocated only one channel and is comparatively more flexible, less complex and cheaper.

Referring to claim 14, Delprat et al do not disclose that the radio communication system comprises a FDD radio communication system.

Hayashi et al disclose that in a FDD system, two frequency bands, which are sufficiently spaced apart from each other, are respectively assigned to transmission and reception. Refer to Column 2, line 65 to Column 3, line 2. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include that the radio communication system comprises a FDD radio communication system. One would be motivated to so do since as compared with TDD, FDD does not introduce latency between the transmit and receive cycles, allows transmission and reception at the same time, and avoids propagation delays that limit the distance between the user and the station.

Response to Arguments

6. Applicant's arguments filed December 29, 2006 have been fully considered but they are not persuasive.

Referring to the argument that Billstrom and Narasimha et al cannot be combined to show that channel measurement sequences are transmitted at substantially constant power levels *and* at substantially a same time (page 8, line 3 to page 11, line 11):

The arguments state that "Since Billstrom is dealing with stationary subscriber terminals, there is also no "handoff" advantage that would result from the base stations transmitting data at the same time" (page 10, line 25 to page 26, line 2). However, Billstrom discloses that the disclosed invention can operate in Dynamic Bandwidth Allocation (DBA) mode. In DBA mode, "any terminal can change allocated frequency with time as the system tries to move the users to make optimum usage of total bandwidth" (Column 5, lines 10-12). Therefore, transmitting channel measurement

sequences at substantially a same time can "ease handoff procedures", as stations are rearranged under different base stations to optimize bandwidth allocation. Although ensuring that all base stations transmit at the same time could increase the amount of interference, the disclosed invention of Billstrom aims to reduce interference. Billstrom discloses a method of "assigning a modulation type considering bandwidth efficiency, coverage range and the interference situation". Refer to Column 1, lines 10-16 and lines 49-63. The Narashima et al process of transmitting channel measurement sequences at substantially a same time can therefore be used in combination with Billstrom.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christine Ng whose telephone number is (571) 272-3124. The examiner can normally be reached on M-F; 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

C. Ng
March 3, 2007

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